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Patent Claims

1. Method of cultivating cells of the most diverse type, particularly human or animal cells, one culture each of cells of at least one specific type being established in a defined environment and the cells of the relevant culture being supplied with assigned, liquid nutrient media, growth factors, gases and the like in the process,

characterized by a combination of the following processing steps:

- a) Preparing of at least one cell culture inside at least one cell culture chamber (20) of a cell culture system (30);
- b) Starting of a flow of freely selectable, defined, liquid media in the at least one cell culture chamber (20) in order to ensure a continuous supply for the at least one cell culture;
- c) Starting of a flow of different gases with freely selectable concentrations into the at least one cell culture chamber (20) in order to ensure a constant, continuous gassing of the at least one cell culture;
- d) Regulated and/or controlled heating of the at least one cell culture chamber (20) in such a way so as to ensure a constant temperature there over the duration of an experiment;

- e) Permanent microscopic observation of the at least one cell culture inside the at least one cell culture chamber (20), without samples of the cell culture being taken over the duration of an experiment; and
 - f) Permanent measuring of all relevant cell culture parameters by means of suitable sensors integrated in the at least one cell culture chamber (20).
2. Method according to claim 1, characterized by the fact that a given number of cell cultures is established inside accordingly assigned cell culture chambers (20), these cell culture chambers being connected in series.
 3. Method according to claim 1, characterized by the fact that a given number of cell cultures is established inside accordingly assigned cell culture chambers (20), these cell culture chambers being connected in parallel.
 4. Method according to one of the claims 1 to 3, characterized by the fact that the type of liquid media and/or their directions of flow and/or their distribution and/or their flow volumes can be varied over the duration of an experiment.
 5. Method according to one of the claims 1, 2 or 4, characterized by the fact that the liquid media are continuously passed on from cell culture chamber to cell culture chamber when the cell culture chambers are connected in series.
 6. Method according to one of the preceding claims, characterized by the fact that the type of gases and/or their directions of flow and/or their distribution and/or the gassing concentrations can be varied over the duration of an experiment.

7. Method according to one of the claims 2, 4, 5 or 6, characterized by the fact that the gases are continuously passed on from cell culture chamber to cell culture chamber when the cell culture chambers (20) have been connected in series.
8. Method according to one of the preceding claims, characterized by the fact that the temperature in the at least one cell culture inside the at least one cell culture chamber (20) is measured permanently and input as an actual temperature value into a corresponding temperature adjusting circuit and/or control circuit; this enables a corresponding adjustment and/or control of the heating of the cell culture chamber.
9. Method according to one of the preceding claims, characterized by the fact that one cell culture of a different type each is established on both sides of a gas-permeable membrane inside at least one cell culture chamber (20) for the purpose of a direct co-cultivation of both cell cultures.
10. Method according to claim 9, characterized by the starting of a first flow of media to the one side of the membrane, i.e. the apical side with the first cell culture, and of a second flow of media that differs from the first one to the other side of the membrane, i.e. the basolateral side, with the second cell culture.
11. Method according to one of the claims 1 to 8, characterized by the application of the method for indirect co-cultivation, different biological systems (i.e. types of tissue/cells) being connected in series in corresponding cell culture chambers (20).

12. Method according to one of the preceding claims, characterized by a video-supported microscopic observation of the at least one cell culture in the at least one cell culture chamber (20).

13. Method according to one of the preceding claims, characterized by the fact that all data that are obtained by

- A permanent microscopic observation of the at least one cell culture inside the at least one cell culture chamber (20) and/or
- A permanent measuring of the relevant cell culture parameters and/or
- A permanent measuring of the temperature in the at least one cell culture inside the at least one cell culture chamber (20),

and are transmitted to a computer-controlled monitoring and control system (G) for further processing there.

14. Method according to claim 13, characterized by the fact that the permanent measuring of the relevant cell culture parameters is carried out by means of a software-aided measuring method.